THE

YOUNG MECHANIC.

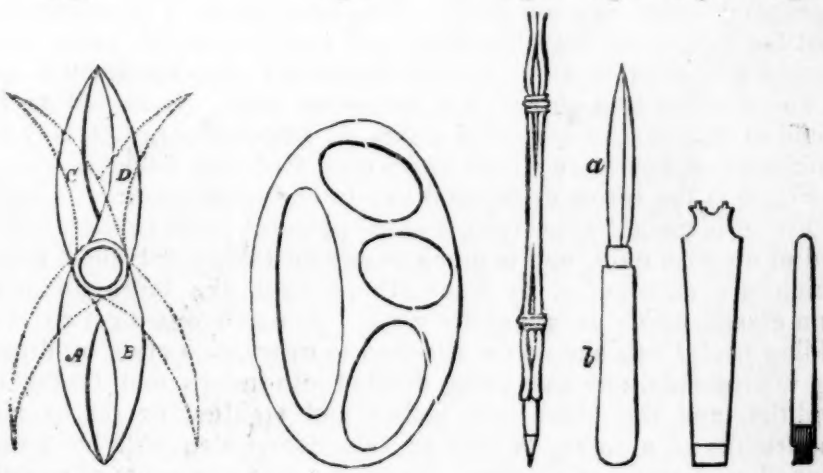
VOL. I. NOVEMBER, 1832. No. XI.

OBSERVATIONS ON DRAWING INSTRUMENTS.

[Continued from p. 148.]

SMALL AUXILIARY INSTRUMENTS.

Fig. 1. Fig 2. Fig. 3. Fig. 4. Fig. 5. Fig. 6.



THE *Calipars*, Fig. 1, is an instrument very similar in construction to a pair of whole and half compasses, and is used for taking the internal and external diameters of cylinders, cones, &c. It cannot properly be called a drawing instrument, but forms a very useful appendage to a case. The two legs A B are of the same length with C D, and when the instrument is opened the latter cross each other as shown by the dotted lines, and when it becomes necessary to take the internal diameter of a hollow cylinder the legs C D are placed inside and opened till their extremities touch the interior surface. The distance measured between the points A B is the distance sought. The *Pistolet*, Fig. 2, is used for drawing irregularly curved lines, and may be made of wood or metal. From the difference in the curvature of different parts of it, it can

generally be adapted so as to draw almost any line, in a much nearer manner and with much more exactness than can be done by the hand alone. Small strips of whalebone, some of them of an equal thickness throughout, serve to draw curves, the curvature of which only varies a small quantity; others, gradually thinned towards one or both ends, serve to draw parts of a curve, or any curve diminishing gradually like them from one extremity to the other. The slips of whalebone are bent so that they pass through the points indicated on the paper as belonging to the curve to be made, which is drawn by a pencil resting against the curved whalebone. Small triangular pieces of lead covered with paper or cloth that they may be used with the greater ease supply on the paper the place of pins, for confirming the slip of whalebone.

Fig. 3 is the *Port crayon*, and is used for holding a pencil when it becomes too short to be held conveniently by the hand. It is usually made of brass or steel, having two sliding rings for closing the extremities which are slit to adapt them to the different sizes of pencils.

Fig. 4 is called the *Eracer*, and is precisely similar in construction to an engraver's scraper, consisting of a triangular blade *a* (the sides of which are a little concave and gradually tapering to a point) inserted in a handle *b*. This instrument is decidedly the best for scratching out blots and lines, as it leaves the paper very smooth and even, so much so that it requires an experienced eye to discover the spot on which it has been used. It is not to be found in any of the imported cases of instruments, but may be purchased at any store where engravers' tools are sold.

Fig. 5 is the screw driver and key in one instrument.

Fig. 6 is made by inserting a small piece of India rubber, in the end of a goose quill, and is much better for taking out short lines, which are surrounded by many others, than the large piece of gum elastic which is generally used. A small one or two feet folding *pocket rule* should be attached to every collection of drawing instruments, one side being divided into inches and tenths or twelfths, and the other into inches and eighths, or tenths and hundredths of a foot. A rule of this description will be found exceedingly useful at all times, for taking measurements of models and all objects of which drawings are to be made. In the selection of this instrument the student should be very careful to have it agree with his other scales of length particularly in its subdivisions, or he will be continually liable to errors. It may be made of well seasoned ivory, and if packed in a small case it would not probably be affected by the heat of the pocket, by which rules are oftentimes cracked and destroyed.

(To be coucluded in our next.)

MEMOIR OF A MECHANIC.

[Concluded from page 153.]

In June, 1823, I left Russia for the United States; and after a voyage of 63 days, was safely landed on India wharf in Boston, Mass.

I amused myself during the passage, at such times as my health would permit, in the study of Mathematics. I had previously made myself acquainted with the improved Engineer's sliding rule and decimal fractions, and committed to memory several useful factors; such as 3·1416, 7·854, 27·648, &c. These and many others were often used, to find the superficial and solid contents, and also, the weight of different bodies. After getting used to the motion of the ship, I commenced making a table, by which I might easily calculate the pressure of a column of water, of any diameter, and of any height. It began with a quarter of a foot, and was continued to several hundred feet high. Before it was finished, however, I perceived several repititions; for the very same figures occurred in different answers; and on examining a little further, I found out the rule by which they were governed, namely, shifting the decimal point; which enabled me to simplify my work very much. I found that the answers to the first nine numbers, would answer for all the others, whether above or below unity; and there is no limit to this, but our powers and our wants; for if we start with a millionth part of a unit, and continue to many millions of units, skipping only a millionth part at a time, we are still very far within its limits; and yet this can be done within a small space, for the table that I first prepared took up many times the room of the improved one, although it was much more limited. I was highly delighted with this discovery. It happened when I had several weeks of leisure, and but little to engage my attention. I pursued this subject with ardor, and before I left the ship, several tables for various purposes were prepared. The voyage seemed too short for me; but my wife was continually complaining of its length, so that my mind was very nicely balanced between two forces.

How tedious a sea voyage of several weeks must be, to persons who have no resources of amusement within themselves; whereas, persons of studious habits may, with a few books, pens and paper, beguile those hours which to others would be almost insufferable. The same may be said of persons confined in a prison, or by sickness.

Having got on shore, and my baggage safely deposited, I purchased a few books and maps for my immediate use, and set out on an excursion into the country, in company with a friend. We crossed the bay to Cohasset, and after climbing the slippery rocks we passed through some woodland to the village. My friend amused himself with his gun for three or four days, while I was looking about me; for everything seemed rather strange and

interesting. In the mechanical way, I saw several simple contrivances which answered the purposes for which they were intended. Among them were cheese and cider presses, and small wind mills with pumps, for raising sea water for making salt. Nature presented many interesting objects, some of which were new to me. The mighty ocean with its rocky shores, and the sea breeze on a sultry day; the wild woods with the chirping, and croaking of their inhabitants; Indian corn; the black snake, skunk and squirrel, and several kinds of birds and water fowl; were among the objects that attracted my attention. We went also to Marshfield; but the scenery here was less interesting. The stone walls which are to be met with every where struck me as very curious. The old lady of the farm house where we stopped was very communicative. She politely showed me the orchard, which was extensive, and the trees well laden with choice fruit. She was pleased with my account of other countries, and in return I was instructed in the mysteries of making fire cakes, dough nuts, &c. and also in peeling apples by machinery. The apple was stuck upon a fork, and caused to revolve by a crank, while a knife something like a spoke shave was held on the apple. The process is very simple, and expeditious. The apples were next quartered, and dried for future use. I was informed by her, that she stood at her front door, and saw the engagement between the Shannon and Chesapeake.

After returning to Boston, I began to think about employment. A small farm and mechanic's shop united, was what I had thought of; and with this view I went about forty miles, to look at a shop and some land that was for sale; but after examining two or three lots that were offered, I concluded it would be best to wait a few years, and get more acquainted with the manner of trading, which I found required some experience. I was led to this conclusion from a transaction that I saw. The man who had two lots of land to sell, called on a tanner and looked out a calf-skin, and after a long talk agreed to pay so much Indian corn for it. He told me it would make two pair of boots, and that the boot maker was to have one half the skin, to pay for working up the other half.

Soon after this, I was engaged to work in a machine shop, at a cotton factory located something less than thirty miles from Boston, where I remained three years, commencing in the middle of September, 1823. Six months passed away without being able to do anything towards my favorite object. In the spring of 1824, however, an opportunity offered for me to attempt the formation of a society for mutual improvement. Two discourses were delivered on fast day, by the clergyman of the village. That in the afternoon was on the importance of knowledge, and the facility with which it can be obtained, by a judicious arrangement of our time, and associating together for mutual benefit. In fact, he expressed my views on the subject so well, that I felt confident of a kind reception, and accordingly waited on him the same afternoon. After stating my views, and presenting him some papers on the subject,

he informed me that a small society for reading, had existed about five years in the village, but was at a very low ebb at that time. He was pleased with my proposals, and invited me to attend the next meeting of the society. I attended, and found a goodly number of both sexes assembled at the house of one of the members. They were engaged in reading by turns, from Whelply's compend of general history, and the president put questions to them as they proceeded, which made it interesting. At the close of this exercise, he asked me how I liked it. 'Very well,' was the reply. I then inquired what other exercise they had. He told me that was all, excepting an annual Address, which he delivered himself. I asked him if it would not be well to try the debating of questions, and familiar lectures on science and the arts. He said he thought well of it, but they felt very cautious how they ventured from the shore, lest they should get into deep water. I told him I thought they need not be afraid, for I had seen persons engaged in such exercises, whose opportunities for intellectual culture were inferior to theirs. I was asked if I could give them a lecture. I said I would try, and prepared myself accordingly. I had brought a small air pump from Russia with me, which I made of a piece of gas tubing, with a ground brass plate on the end of the barrel. I bought a few glass articles at a store, which were ground to fit the pump plate, with a little sand and water, on the hearth stone of my room. I also procured a small wash tub, and fitted a shelf to it for a pneumatic cistern. In this way I succeeded with a very simple apparatus, in explaining the mechanical and some of the chemical properties of the air. This put new life into the society. Their constitution was revised to provide for a library and apparatus. Debating was also adopted with success, and the ladies handed in compositions, which were read at the meetings. The reading exercise was pursued only occasionally. Several of the members were prevailed on to give lectures, on subjects connected with their professions, unless some particular branch of knowledge had been studied by them. It required considerable effort on the part of the active members, to bring those forward that were very diffident. More than one case occurred, however, in which gratitude was felt by those who had been thus roused into action.

The society continued to meet at the members' houses, until it became too large to be thus accommodated. They then tried the school house, and the hall at the tavern; but not being satisfied with these, they built a two story building for their accomodation, at an expense of twelve hundred dollars. The building was completed within two years from the time I was first introduced to the society. The hall was let to another society, and there were two mechanics' shops under the hall.

I left this place to reside in Boston in October, 1826, and have not visited it since, but have frequently heard of the prosperity of the society, and have seen two persons very recently, who report it to be in a flourishing state.

On my arrival in Boston, the very first business I attended to, was to make inquiries respecting mechanics' societies, and was surprised to find that no society existed, to which a mechanic could go and hear lectures on subjects calculated to aid him in his vocation. There had been some talk of building a mechanics' hall, &c.; but that project was abandoned. I conversed with several persons on the subject, who were willing to assist in forming a society for mutual improvement. I put a notice in a newspaper, stating where names would be received, and finally called a meeting, which was attended by nine persons, and a second meeting which was attended by only seven. At this meeting it was determined to make the thing more popular, by advertising in the daily papers, and hiring a hall in a central situation. The next meeting was held at Concert Hall, and was very well attended. The result was the formation of the Boston Mechanics Institution.*

This society soon became very popular, which induced others to imitate the example thus set; by which it was evident that in Boston, as well as in other places, it only required a little exertion on the part of those who felt an interest in the subject, to induce a portion at least of our citizens to improve these advantages.

The Massachusetts Charitable Mechanic Association was next in the field. Soon after this, meetings were held to form a lyceum adapted to the city. Several plans were offered, but none of them met with general approbation. The consequence was, a division took place. One party formed the society for the Diffusion of Useful Knowledge, while the other formed the Boston Lyceum. Since that time, several minor soiceties have been formed,† besides the Franklin Lectures which have been got up particularly for the accomodation of Mechanics.

Boston is now well supplied with societies for the improvement of the mind. Some of the larger ones, however, should be modified. The four societies which I have named above, have each of them regular courses of lectures; but they treat on so many different subjects in one season, that no person can get more than a smattering knowledge of any subject. Each society should take its own stand. Let one take a stand decidedly of a mechanical nature, another of a mercantile, &c ; and instead of one or two lectures on a subject, let there be a dozen given, if the nature of the subject requires it. We should then get information that would be more substantial; our knowledge would be more thorough; and the interests of the various societies would not clash.

I have now accomplished my task; and in conclusion I would observe, that I have had considerable pleasure in reviewing my conduct, in my leisure hours, as many of my notions have since been of substantial benefit to me in my trade. My aim has been,

* Some account of this society will be found in our last number, page 163. EDS.

† A list of these societies is given at page 97 of our Jnne number. EDS.

to blend amusement with instruction. If this has been done, I am satisfied. To my young friends I would say, that knowledge is power, wealth, and distinction; that industry and prudence will in general, lead to independence and respect; while idleness and dissipation, will end in slavery and disgrace.

IMPROVEMENT IN PLASTERERS' TOOLS.

MESSRS. EDITORS—Among the innumerable multitude of labor saving machines, there is none for rendering more easy that extremely laborious employment, plastering. The present method requires the whole strength of a man to be exerted, through nearly the whole process; consequently producing excessive fatigue, and unfitting him both bodily and spiritually for intellectual pursuits or rational amusements. Permit me then, to assure those persons who possess the nack of invention, that if their ingenuity can construct a machine for leveling plastering, which will dispense with the present heart-acking and bone-acking method, they will receive ample pecuniary compensation and the sincere thanks of a large class of practical mechanics. D. B. H.

ETCHING ON GLASS.

MESSRS. EDITORS—The following is a simple method of etching on glass on a small scale. First spread a thin coating of beeswax over the vessel you wish to etch, then with a fine pointed instrument mark through the wax down to the glass. Put in a tin or leaden cup about a table spoon-full of pulverised fluor spar, and upon this pour a sufficient quantity of sulphuric acid to moisten it. Place the glass on the cup with that part which is to be etched downward. Then put the cup in warm water for about 20 minutes, when the etching is finished. Care must be taken not to melt the wax.

L****e.

A LARGE TREE.

The following account of a remarkably large tree I copy from the London Mechanic's Magazine. A. Z.

'An oak tree was a short time ago felled in Ludlow, near Shopshire, the produce of which was thirty nine tons of timber, fifty five cords of wood, two hundred park pales, and four cords of brackets, A bough broke off before the tree was cut down which weighed seven tons and a half. Three men were employed a month in stacking it. The tree was valued at £165.'

From the Journal of the Franklin Institute.

APPARATUS FOR RAISING HEAVY WEIGHTS.

DEAR SIR—I send you the description of a hook or lever for raising stone, which I have found very useful for the particular purpose for which it was intended. It is, I believe, new; but it is very possible that your intimate knowledge of whatever has been done in the way of mechanical contrivances, may convict it of being a 'modern antique.' If you cannot find its prototype, I think I may safely lay claim to it as an original invention; and in that case I would thank you to insert this description in your valuable journal, with a hope that it may be found of use in other cases similar to that in which I have employed it.

Yours, respectfully,

Baltimore, July 31st, 1832. WM. HOMARD.

DESCRIPTION.

The M'Kim school, now erecting in Baltimore by the liberality and taste of a public spirited individual, is to be an exact copy, as to the portico, of the celebrated temple of Thescus at Athens, and of the precise size of the original. The body of the building is composed of blocks of granite ashler, from Ellicott's mills, each course being of the same height. To permit these blocks to be placed with accuracy and convenience, it was necessary to suspend each one in such a manner as to leave its bed and sides entirely free. The Lewis with two pins, represented in fig. 1, and similar to one described in Rondelet, *Art de Batir* was tried, and found to succeed very well, requiring only two holes to be bored about three inches deep, which can be done in the granite with great facility. Still it was desirable to avoid the labor of fitting this Lewis to more than 400 blocks, and the contrivance represented by fig. 2, was invented for the purpose, and has been found to answer perfectly.

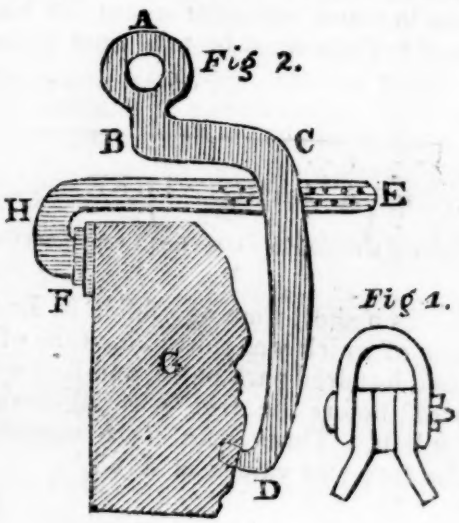


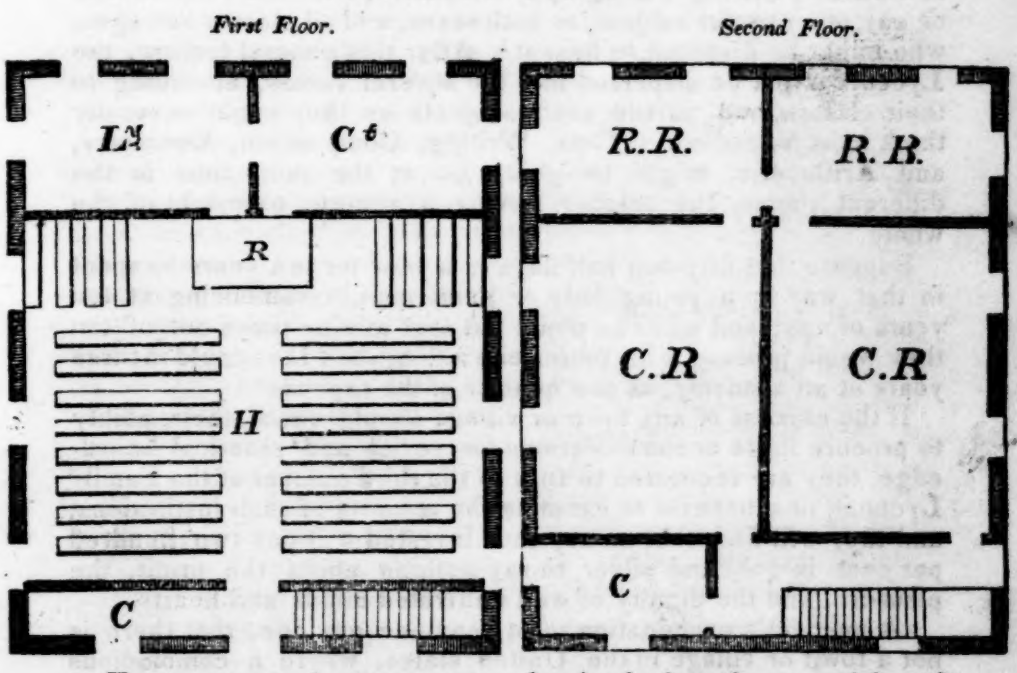
Fig 2.

Fig 1.

It consists of an iron bar, bent in the form A B C D, and of a size proportionate to the blocks of ashler intended to be raised. At C a mortise is made through it, admitting freely the bar H E. This bar is pierced with holes, as shown in the figure, through one of which an iron pin is put, to prevent it from slipping towards H. At F is a plate attached to this bar, between which and the ashler block G, a piece of wood is placed to keep the iron from injuring the worked face of the block. The end D forms a steel pin, which may be inserted about an inch into a hole bored in the block; but in cases where the least projection or shoulder can be found for this point to catch hold of, this labor of boring is not necessary; the smallest prominence being sufficient to give the instrument a perfectly firm hold, or gripe, of the stone, which becomes still firmer as the weight comes to bear on it.

From the Family Lyceum.

VILLAGE LYCEUM.



Every year and almost every day is placing these social and republican institutions upon a more permanent foundation. Experience is constantly bringing up new measures to increase their interest and extend their usefulness. And no two steps are probably more important, than the erection of commodious buildings and a system of circuit teaching, each eminently calculated to aid the other, and both united capable of ensuring complete success in

any town or village in the United States, where the two measures shall be adopted.

A Lyceum building, furnished with apparatus, collections in natural and artificial productions, books, &c., could not fail to give interest to the instructions of a circuit teacher, who should use them in 6 or 12 towns in succession: and the aid of an experienced teacher, even if it was but once a fortnight, must render the personal and mutual efforts of his pupils in the use of their *intellectual tools* doubly efficient and interesting.

Above will be seen the plan of a Village Lyceum, representing the rooms in the first and second stories. On the lower floor, is the hall, or public lecture room, the labratory, and the cabinet: on the second floor, are two class-rooms, two recitation-rooms, and a closet for depositing such apparatus, books, &c., as may be needed from time to time in the upper rooms.

Suppose that a circuit teacher was to spend half a day in giving instruction to a Lyceum, and especially in aiding the members to instruct each other. The first exercise might be a lecture on Astronomy, Geology, Geography Geometry, Grammar, Arithmetic or any other useful subject, to both sexes, and all classes and ages, who might be disposed to hear it. After this general lecture, the Lyceum might be dispersed into the several rooms, according to their classes, and pursue such subjects as they might severally think most expedient. Thus, Writing, Composition, Geometry, and Arithmetic, might be going on at the same time in the different rooms, the teacher having a general oversight of the whole.

Suppose that fifty-two half days in a year for ten years be spent in that way by a young lady or gentleman, commencing at ten years of age; and who can doubt but that in nine times out of ten they would procure a far better education, than they could in three years at an academy, at one quarter of the expense?

If the citizens of any town or village should doubt their ability to procure these accommodations for social and practical knowledge, they are requested to turn to the third number of the Family Lyceum, or otherwise to examine the *economy* of such institutions, and they will find, that money thus invested will pay two hundred per cent. in gold and silver, to say nothing about the profit, the pleasure, and the dignity of well cultivated minds and hearts.

A moment's examination must convince any one, that there is not a town or village in the United states, where a commodious Lyceum building would not be good property. In our older settlements, they are important and easily procured; in newly settled countries, they are nearly indispensable, as some places for education and religious worship are necessary, and as it is difficult at the outset to procure all the public buildings which might be desirable.

A Lyceum would not only furnish accomodations for a system of circuit teaching, to be given once in one or two weeks, but it

might be used for a daily school, and for religious worship on the sabbath; and through most of the western states, furnish better accommodations than are at present provided.

It may be asked how these Lyceums can be erected? To this question the answer is short. Let fifty persons each take a share of twenty-five dollars; or a smaller number take fifty shares of twenty-five dollars each, and it would raise $1,250, which, in a large majority of cases, would be sufficient. In the most newly-settled places, where it might be difficult to raise even that sum in money, the labor, timber and other stock, contributed by the citizens, might answer as a substitute. In one way or other, such a building may be procured without inconvenience in each of the five thousand towns in the northern states, and one at least in every county in all the states at the west and south. And however it may be procured, the history of every community since the first city was built by Enoch and called by his own name, proves that it would be for the pecuniary, no less than the intellectual and moral prosperity of those who might provide it for themselves and their posterity.

What portion of a community need fail of receiving instruction and entertainment from such a place of social and intellectual resort? Could not the farmer resort to it for special instruction in agriculture from his fellow-laborers, as well as for a knowledge of general science by professional teachers? Might not mechanics also hold there, special meetings? And might not each Lyceum be a Teacher's Seminary, where those living in the vicinity might meet, and aid each other in their responsible and dignified profession? Might not ladies resort thither once a week during the summer, and receive the water of life from the same fountain? And *Mothers*, too; where could they go, to receive so much benefit from *each other*, in their dignified charge, their holy office, as at the Village Lyceum, where every thing might be found calculated to enlarge and gratify those deathless spirits to which they gave existence, as they were fast budding for immortality? What man, what woman, what child, might not be made wiser, and happier, by such a fountain of knowledge? Of what town, village or neighborhood will the citizens withhold their hands from a work, which will ensure to themselves and their posterity the blessings of wealth, and the dignity and happiness of enlightened minds, and pure and elevated hearts?

PATENTS FOR MASSACHUSETTS,

GRANTED IN APRIL, 1832.

For an improvement in the *Machine used for Pegging Boots and Shoes*. Frederick Gray, Rowley, Massachusetts, April 6.

The machine here patented for pegging boots, consists of an improved apparatus for holding the last firmly during the operation;

to explain the contrivance clearly, would require a drawing, and we think but few will feel interest enough in the subject to regret the want of this appendage.

For a *Machine for making Axes.* Josiah Pratt, jr., Claremont, Massachusetts, April 6.

This machinery consists of what the patentee denominates hammer and anvil dies; the first kind are to be worked like a trip hammer, the last, as the name indicates, forming the anvil, or bed. A particular description of the curvature of the faces of these dies, and of their size, is given in the specification.

The foundation of the axe from the bar of iron, is laid with one pair of dies, and another set is used for finishing. There is no claim made; reliance being placed on the entire novelty of the whole plan. 'The manner of holding the iron under the dies, and the skill of moulding the axe,' we are told, can be learnt only by observation and practice.'

For machinery for *Cutting and Manufacturing wooden boxes.* Harrison Holland, Belchertown, Massachusetts, April 13.

Wooden boxes are of so many kinds that the above title must fail in furnishing any definite idea of the intention of the machinery; nor does the petition, or the specification, supply the required information; we collect, however, from the drawing and the general description of the apparatus, that the boxes are to be round, and made out of solid stuff. An auger, running in the mandril of a lathe, is used to bore the boxes out, whilst cutters, placed at a proper distance from the auger, form the outside. A sliding carriage in front holds the timber, and this is brought up by proper contrivances against the auger and cutters. A circular saw, upon a sliding carriage, is used to cut the box off. The lids, it is said, may be formed on the same principle, but in this case the auger is to be shortened in due proportion. At the end of the specification we are told that 'green timber will answer as well as that which is seasoned. This information is not calculated to throw much light upon the purposes for which the said boxes are to be made, as they will soon lose their rotundity if made of unseasoned stuff.

There is no claim made to the machinery as a whole, or in part, excepting that in speaking of the auger with which the boring is to be effected, it is said that it is a 'screw auger, *without a centre;* this is claimed as a new invention, and may be applied to other uses.' The fact is, that the screw auger, without a centre, has been applied to other uses long since, and therefore it is not new. We have in our possession one of this description, which was patented so long since that the patent has run out.

For *Door Fasteners.* Calvin Washburn, Bridgewater, Massachusetts, April 18.

This is a spring door catch, operated on by handles in the usual way, but with some peculiarity in the arrangement of the parts which may be called new, and upon which the claim rests. We

are not aware, however, that it is superior to some others, and shall therefore dismiss it, as, without a drawing, its peculiarity could not be easily described.

For *Protecting Bank Notes, &c.* from being counterfeited Francis Peabody, and Joseph Dixon, Salem, Massachusetts, April 20.

The object had in view by the patentees is to prevent the counterfeiting of bank notes by means of lithography. Those acquainted with that art are aware that the impression upon a bank note, or other engraving, printed with ink into which oil enters as a component part, may be transferred on to stone, and the stone then used to furnish similar impressions on paper. According to recent accounts from Europe the utmost perfection has been attained in this process, which, as it is merely mechanical, may enable one who is no artist to imitate the work of the best engravers in a way which shall defy detection.

The means by which the patentees effect their object is by taking printer's ink, or ink made from oil, which is to be made of a pink, light blue, or other tint, and which will serve as a ground for the black ink generally used in printing bank notes. The paper intended to be printed on is first covered wholly, or in part, with the light colored oleagenous ink, and after this the notes are printed with black ink in the usual way. Any attempt to make a lithographic transfer from paper so prepared must fail altogether, as every part which has either the tinted or the black ink on it, will affect the stone, and only a confused, blurred impression, can be obtained from it.

The claim is to the preparing of paper in the manner described.

For an *Engine for turning Whip Sticks*, or Handles. Andrew Mallory, Russel, Massachusetts, April 27.

This engine is intended to be used in turning whip handles tapering, either regularly or otherwise, and it may also be employed for helves, or other sticks, whether cylindrical or tapering. The stick to be turned may be fixed in the mandril of a common turning lathe, and the apparatus here patented placed in front of it. It consists, in part of a frame with parallel sides, equal in length to the length of the stick to be turned. A piece carrying a cutter, which operates as a gouge and chisel, slides along in grooves on these sides. This sliding part consists of two bars hinged together at one end, and capable of being opened or closed at the other; and near to this latter end is fixed the cutter before spoken of. The stick to be turned rests on a hollow bearing of metal on the lower piece, and the cutter passes through the upper piece. It is evident that if these two parts, which formed the hinged sliding bar recede from each other as the bar advances, the article operated upon by the cutter will have a corresponding increase in its diameter. To effect this, each of the bars has a tongue on it which slides in a groove on one of the cheeks of the frame. There are, of course two grooves, and if these were parallel to each other, the two parts

of the sliding bar would keep at the same distance apart, and the article turned would be cylindrical; but if the grooves recede, the bars will be gradually separated, and the article will be tapered.

The whole machine is claimed as new, and not as an improvement on any other for the same purpose previously known.

For *Applying Copal or other Varnish* to Whip stocks, or other articles, by dipping. Frederick Morgan, Westfield, Massachusetts, April 27.

The articles to be operated on are to be dipped into a tube filled with the varnish, which, it is said, is a superior method to the use of a brush. This is the whole recipe, and we are very apprehensive that there are but few persons in the habit of using varnish who have not occasionally resorted to the same mode; we have repeatedly done it, although not with whip stocks, and we may probably do it again, with ' other articles,' the patent before us to the contrary notwithstanding.

ECONOMY OF HEAT.

Messrs. Editors—Your hopeful correspondent J. M. W. has undertaken the task of reviewing my 'hints on the economy of heat,' &c. He has performed it in a style which indicate that his ship carries more sail than ballast, or at any rate, that on this occasion he has condescended to use a pound of ridicule to an ounce of argument, and has shown his weakness by attacking those parts the most furiously that were of the least consequence, and still more so, by altering my language to suit his own purpose. I shall pursue a different course, and confine my remarks to points of most importance. As to the state of the air, the queries are—the quantity of heat it will contain after travelling through miles of tubes—whether it will be hot or warm—and the danger of suffocation from dry air. These might be startling questions if put to one entirely ignorant of chemistry, but thanks for my good fortune in having picked up a few facts that will be of service to me at this time. That air has been heated in one room and conveyed in tubes to other rooms at short distances, will not be denied; but how far it might be conveyed without too much waste of heat, must be determined by experiment. In England an attempt was made to cool the air in the heat of summer, by passing it through a subterranean passage to a meeting house, but was found not to answer because the sides of the passage gradually acquired nearly the same degree of heat as the external air, and finally had very little effect on lowering its temperature. This is favorable to my plan; for if the tubes were lined with some substance that were a very slow conductor of heat, and the air passed through them with considerable velocity, it might be conveyed to a great distance

with but little loss of heat. With respect to the danger of suffocation from the air being too dry, I believe it is an established fact, that the hotter the air is, the greater quantity of aqueous vapor it will hold in suspension; and if the air be allowed to pass over a sufficient surface of water, it will take up just what vapor it needs, and deposit it on the sides of the tubes as it parts with its heat; so that by proper management the air may be kept in the most fit state for breathing. If it were necessary, jets of steam might be suffered to play into the hot air as it left the furnace. It is asked, What is to be done if the pipes should be injured by accident? I should say, for want of a better remedy, that stoves may be used *pro tempore* until the pipes are repaired; and if there are no chimneys in the house, put the funnel through the window, as is often done at present. But I apprehend there would be other plans thought of if the thing were carried into operation, as there has been when the pipes used for water, or gas, got out of order. Our reviewer speaks of ejecting the air into the rooms by the force of a steam-engine, as though we were to be blown out at the window by the tremendous blast. I would observe, that although the steam-engine is very powerful, it can be used for the most delicate work; and in this case methods for regulating its power, so that the air can be admitted as gently as we please, will be readily found. As the air would be constantly issuing from the room to give place to fresh air, there would be none of those draughts of cold air so injurious in our present modes of heating by stoves, supplied with air from the various crevices in the sides of the room.

The kitchen at the back of the dwelling house seems to trouble J. M. W. considerably. I will point him to a quarter of this city where no kitchens are used. What objections are there to warming by hot air the buildings on the wharves, and on the various streets where there are no dwelling houses, and moreover where there are seldom any lights wanted at night. If there are, the gas lights do not produce sparks; and if it is necessary to carry a light about at all, it might be put into a lanthorn. Having noticed what I supposed to be most important, I shall leave the rest for another opportunity if it should appear necessary. PHILO.

A GOOD EXAMPLE.

We extract the following from a letter recently received. If this example were followed generally, the Young Mechanic might be enlarged and otherwise improved, so as to increase its usefulness without altering the price. We have received several such testimonies of approbation, and can only say to all our friends, go and do likewise.

EDS.

Messrs. Editors—I enclose $12 for twelve subscribers to the Young Mechanic. Please to remit all the numbers published, and send the remaining numbers when published by mail. I perceive that persons

obtaining subscribers are entitled to every sixth copy. However, I do not require it, as I have obtained the subscribers partly in my leisure time, and I further consider it a duty incumbent upon every man that wishes to promote the arts and sciences, to bestow a small portion of his time in trying to circulate general mechanical knowledge; for every intelligent man must know, that a nation can never be blessed or prosperous, unless she enjoys a high cultivated state of mechanical science; and I think, that a work like the Young Mechanic is well fitted to disseminate this branch of knowledge. Consequently, I shall recommend it to my friends and others without any compensation.

Lowell, Oct. 31. 1832. W. W. C.

ANSWERS.

We have received several answers to the question in our last number, from which two are selected. They are of two kinds. One says the question as proposed is impossible to answer. The other admits of the denominator being altered to correspond with the numerators. We are inclined to the first opinion, because it will not work both ways; that is, if A and B's horses do 3-4 of the work, of course there is only 1-4 left for the horse C to do. By reasoning in this way we find that A does 7, B 2, and C 5 twentieths; and if we make the denominator 14, the answer differs from that obtained by making the denominator 23.—EDS.

A $9·25 3-4. B $10·58. C $6·61 1-4.

A and B's horses did 3-4 of the work, C's horse 1-4. A's and C's horse did 1-4 or 5-20 and C's horses 13-20, B's horse must have done 8-20, and A's horse must have performed the remaining 7-20. A and C's horse did 6-10, and not 9-10 of the work as stated in the question. R. S.

MESSRS. EDITORS—The question communicated by a subscriber, and published in the Oct. No. of the Mechanic, I have solved in the following manner:—I reduced or changed the fractions three fourths and nine tenths to fifteen and eighteen twentieths; then I added the numerators fifteen, eighteen, and thirteen together, and divided the amount by two; because each man's horse is named twice. And from the quotient I subtracted each numerator successively:

thus,
23 — 13 = 10. A's share of the numerator.
23 — 18 = 5 B's share of the numerator.
23 — 15 = 8 C's share of the numerator.
23

Now by three statements in proportion the answers are found.

thus,
23 : 26·45 :: 10 = $11·50 A's share.
23 : 26·45 :: 5 = $5·75 B's share.
23 : 26·45 :: 8 = $9·20 C's share.
$26·45

Sancook, Oct. 27th, 1832. T. J. TENNEY.